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(81)

CLAIMS

1. Dispensing unit (1) for dispensing two fluid substances, comprising:
 - a pump assembly (2) having a first pump (4) and a second pump (5), which can be actuated by common, manually operable operating means (6) so that they simultaneously dispense the two fluid substances, and
 - a reservoir assembly (3) for holding the two fluid substances,the reservoir assembly (3) comprising two reservoirs (8, 9), which are each provided with an outlet (12, 15) at an outlet side and are each delimited by a movable piston (13, 16) on the side remote from the outlet, which pistons (13, 16) move towards the respective outlets (12, 15) during the dispensing of the fluid substances, characterized in that the reservoir assembly (3) and the pump assembly (2) are separate assemblies which can be coupled to one another, in such a manner that in the uncoupled state each reservoir (8, 9) can be filled through the outlet (12, 15) of the reservoir (8, 9), after which the pump assembly (2) and the reservoir assembly (3) are coupled to one another.
2. Dispensing unit according to claim 1, characterized in that each piston prior to filling of the respective reservoir is located in a filling position close to the outlet.
3. Dispensing unit according to claim 1 or 2, characterized in that a first reservoir is delimited by an inner side of a first substantially cylindrical tube, the reservoir being delimited, on the side remote from the outlet side, by a continuous, substantially disk-like piston.
4. Dispensing unit according to one or more of claims 1-3, characterized in that a second reservoir is delimited by the outer side of the first cylindrical tube and an inner side of a second substantially cylindrical tube, which surrounds the first cylindrical tube, the reservoir being

delimited, on the other side from the outlet side, by a continuous, substantially annular piston.

5. Dispensing unit according to one or more of claims 1-4, characterized in that the diameter or cross section of the first and/or second reservoir decreases in the direction of the outlet side over at least a section of the length of the reservoir.
6. Dispensing unit according to claim 5, characterized in that the diameter of the inner side of the first cylindrical tube decreases in the direction of the outlet side.
7. Dispensing unit according to claim 5 or 6, characterized in that the distance between the outer side of the first cylindrical tube and the inner side of the second cylindrical tube decreases in the direction of the outlet side.
8. Dispensing unit according to one or more of claims 5-7, characterized in that the diameter of the inner side of the second cylindrical tube decreases in the direction of the outlet side, the outer side of the first cylindrical tube being straight.
9. Dispensing unit according to one or more of claims 1-8, characterized in that the diameter or cross section of the first and/or second reservoir is increased at the abovementioned filling position in the vicinity of the outlet, in such a manner that the piston is under a reduced prestress in the abovementioned filling position in the vicinity of the outlet.
10. Dispensing unit according to claim 9, characterized in that the diameter of the inner side of the first cylindrical tube, at the location of the piston position in the vicinity of the outlet, substantially corresponds to the diameter of the substantially disk-like piston.

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11. Dispensing unit according to claim 9 or 10, characterized in that the distance between the outer side of the first cylindrical tube and the inner side of the second cylindrical tube, at the location of the piston position in the vicinity of the outlet, substantially corresponds to the width of the ring of the substantially annular piston.
12. Dispensing unit according to one or more of claims 1-11, characterized in that the reservoir assembly comprises a cover which closes off the reservoirs on the outlet side, the first and second outlets being arranged in the cover.
13. Dispensing unit according to claim 12, characterized in that the cover is formed integrally with the second cylindrical tube.
14. Dispensing unit according to claim 12 or 13, characterized in that the cover comprises a coupling rim for coupling a pump assembly to it in order to form a dispensing unit.
15. Dispensing unit according to one or more of claims 12-14, characterized in that the cover is designed to receive a filling head for filling the first and second reservoirs.
16. Dispensing unit according to one or more claims 1-15, characterized in that the reservoir assembly further comprises a connecting element which connects the first and second cylindrical tubes to one another in the vicinity of the ends of the first and second cylindrical tubes which are remote from the outlet side.
17. Dispensing unit according to claim 16, characterized in that the connecting element is formed integrally with the first cylindrical tube.
18. Dispensing unit according to one or more of claims 12-17, characterized in that the cover is connected to the first and/or second cylindrical tube by means of a click-fit connection.

19. Dispensing unit according to one or more claims 12-18, characterized in that the connecting element is connected to the first and/or second cylindrical tube by means of a click-fit connection.
20. Reservoir assembly clearly intended for a dispensing unit according to one or more of claims 1-19.
21. Method for assembling and filling a reservoir assembly of a dispensing unit according to one or more of claims 1-19, which method is characterized by the following steps:
 - the assembling of the reservoir assembly,
 - the placing of a filling head of a filling unit which is suitable for filling the two reservoirs onto the reservoir assembly,
 - the filling of the first and second reservoirs, during which step the first and second reservoirs are filled through the first and second outlets, respectively, and
 - the removal of the filling head.
22. Method according to claim 22, characterized in that each piston, after the reservoir assembly has been assembled, is located in the abovementioned piston position in the vicinity of the outlet, the pistons moving from the piston position in the vicinity of the outlet towards the piston position of a completely filled reservoir during the filling operation.
23. Method according to claim 21 or 22, characterized in that prior to filling of the first and/or second reservoir, the air which is present in the first and/or second reservoir, respectively, is at least partially sucked out by means of the filling unit.
24. Method according to claim 22 or 23, characterized in that the first and second reservoirs are filled simultaneously.
25. Filling unit for filling a reservoir assembly according to

claim 20, characterized in that the filling unit comprises a filling head which is suitable for placing onto the reservoir assembly and comprises at least two plunger pumps for filling the first and second reservoirs.

26. Filling unit according to claim 24, characterized in that the filling unit also comprises a third pump, in particular a plunger pump, for sucking out the air which is present in the reservoirs prior to filling the first and second reservoirs.
27. Dispensing unit for dispensing a first and a second fluid substance in a defined (volumetric) ratio, comprising:
- a first and a second reservoir for a stock of the first and second fluid substances, respectively,
 - a pump assembly, which comprises a first and a second pump which each have a pump chamber with a defined operative volume, and a common, manually operable operating member for actuating the first and second pumps,
- characterized in that the pump assembly comprises one or more exchangeable pump elements which form at least part of the first and/or second pump, so that the operative volume of the pump chamber of the first and/or second pump can be adjusted by selection of one or more suitable exchangeable pump elements and fitting of these elements in the pump assembly.
28. Dispensing unit according to claim 27 and one or more of claims 1-19.
29. Dispensing unit according to claim 27 or 28, characterized in that the pump assembly also comprises a base part with a holding section for holding at least one of the exchangeable pump elements.
30. Dispensing unit according to claim 29, in which the holding section is designed to centre and/or position the at least one exchangeable pump element.

31. Dispensing unit according to one or more of claims 27-30, characterized in that the pump assembly comprises a first exchangeable pump element which is held in the base part and is coupled to the actuating member.
32. Dispensing unit according to claim 31, characterized in that the first and/or second pump is a bellows pump, the first exchangeable pump element at least partially forming a bellows pump chamber.
33. Dispensing unit according to one or more of claims 27-30, characterized in that the pump assembly comprises a first and a second exchangeable pump element, the first exchangeable pump element being coupled to the operating member and the second exchangeable pump element being held in the base part.
34. Dispensing unit according to claim 33, characterized in that the first and/or second pump is a piston pump, the first exchangeable pump element forming the piston of the first or second pump and the second exchangeable pump element forming the cylinder of the first or second pump.
35. Dispensing unit according to claim 34, characterized in that each pump is a piston pump, and in that the first exchangeable pump element forms both pistons and the second exchangeable pump element forms both cylinders.
36. Dispensing unit according to claim 34 or 35, characterized in that the first exchangeable pump element comprises a base surface, on which two cylindrical walls are arranged substantially at a right angle in order to form the pistons, and in that the second exchangeable pump element comprises a base plate on which two cylindrical walls are arranged substantially at a right angle in order to form the cylinders.
37. Dispensing unit according to one or more of claims 27-36,

characterized in that the pump assembly is removably coupled to the first and/or second reservoir.

38. Dispensing unit according to one or more of claims 27-37, characterized in that the base part is provided with coupling means for optionally releasably coupling the pump assembly to the first and/or second reservoir.
39. Dispensing unit according to one or more of claims 27-38, characterized in that the first reservoir and the second reservoir are formed as a single entity.
40. Dispensing unit according to one or more of claims 27-39, characterized in that the first and second pumps are designed coaxially, in particular concentrically.
41. Dispensing unit according to one or more of claims 27-40, characterized in that the reservoirs are designed coaxially, in particular concentrically.
42. Dispensing unit according to one or more of claims 27-41, characterized in that the first and second reservoirs are of the "airless" type.
43. Dispensing unit for dispensing one fluid substance, comprising:
 - at least one reservoir for a stock of fluid substance,
 - a pump assembly having at least one pump which has a pump chamber with a defined operative volume, and an easy-to-operate operating means for actuating the at least one pump,characterized in that the pump assembly comprises one or more exchangeable pump elements which form at least a section of the pump, so that the operative volume of the pump chamber of the pump can be adapted by selecting one or more suitable exchangeable pump elements and by fitting them in the pump assembly.
44. Dispensing unit according to claim 43, characterized in

- that the pump assembly also comprises a base part having a holding section for holding at least one of the exchangeable pump elements.
45. Dispensing unit according to claim 44, in which the holding part is designed to centre and/or position the first exchangeable pump element.
 46. Dispensing unit according to one or more of claims 43-45, characterized in that the pump assembly comprises a first exchangeable pump element which is held in the base part and is coupled to the actuating member.
 47. Dispensing unit according to claim 46, characterized in that the pump is a bellows pump, the first exchangeable pump element forming a bellows pump chamber.
 48. Dispensing unit according to one or more of claims 43-45, characterized in that the pump assembly comprises a first and a second exchangeable pump element, the first exchangeable pump element being coupled to the operating member and the second exchangeable pump element being held in the base part.
 49. Dispensing unit according to claim 48, characterized in that the pump is a piston pump, the first exchangeable pump element forming the piston of the pump and the second exchangeable pump element forming the cylinder of the pump.
 50. Pump assembly clearly intended for a dispensing unit according to one or more of claims 27-49.
 51. Method for the production of a dispensing unit according to one or more of claims 27-49, in which one or more suitable exchangeable pump elements are selected from a stock of different exchangeable pump elements as a function of the desired operative volume of the pump chamber of the first and/or second pump and are fitted in the pump assembly.

52. Method for filling a reservoir assembly (3) of a dispensing unit (1) for dispensing two fluid substances, said dispensing unit comprising:

- a pump assembly (2) having a first pump (4) and a second pump (5), which can be actuated by common, manually operable operating means (6) so that they simultaneously dispense the two fluid substances, and

- a reservoir assembly (3) for holding the two fluid substances,

the reservoir assembly (3) comprising two reservoirs (8, 9), which are each provided with an outlet (12, 15) at an outlet side and are each delimited by a movable piston (13, 16) on the side remote from the outlet, which pistons (13, 16) move towards the respective outlets during the dispensing of the fluid substances, characterized in that the reservoir assembly (3) and the pump assembly (2) are separate assemblies which can be coupled to one another, and that the method comprises the steps of:

- filling in the uncoupled state each reservoir (8, 9) through the outlet of the reservoir, and subsequently
- coupling the pump assembly (2) and the reservoir assembly (3) to one another.

53. Method according to claim 52, characterized by filling the two reservoirs (8, 9) simultaneously.

54. Dispensing unit (1) for dispensing two fluid substances, comprising:

- a pump assembly (2) having a first pump (4) and a second pump (5), which can be actuated by a common, manually operable operating means (6) so that they simultaneously dispense the two fluid substances, and

- a reservoir assembly (3) for holding the two fluid substances,

the reservoir assembly (3) comprising two reservoirs (8, 9), which are each provided with an outlet (12, 15) at an outlet side and are each delimited by a movable piston (13,

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16) on the side remote from the outlet, which pistons (13, 16) move towards the respective outlets (12, 15) during the dispensing of the fluid substances, characterized in that the reservoir assembly (3) and the pump assembly (2) are separate assemblies which can be coupled to one another, in such a manner that in the uncoupled state each reservoir (8, 9) can be filled through the outlet (12, 15) of the reservoir (8, 9), after which the pump assembly (2) and the reservoir assembly (3) are coupled to one another, and in that each piston (13, 16) prior to filling of the respective reservoir (8, 9) is located in a filling position close to the outlet (12, 15), the diameter or cross section of the first and/or second reservoir (8, 9) being increased at the abovementioned filling position in the vicinity of the outlet (12, 15), in such a manner that the piston (13, 16) is under a reduced prestress in the abovementioned filling position in the vicinity of the outlet (12, 15).

55. Reservoir assembly (3) for a dispensing unit for dispensing two fluid substances, comprising two reservoirs (8, 9), which are each provided with an outlet (12, 15) at an outlet side and are each delimited by a movable piston (13, 16) on the side remote from the outlet, which pistons (13, 16) move towards the respective outlets (12, 15) during the dispensing of the fluid substances, characterized in that each piston (13, 16) prior to filling of the respective reservoir (8, 9) is located in a filling position close to the outlet (12, 15), the diameter or cross section of the first and/or second reservoir (8, 9) being increased at the abovementioned filling position in the vicinity of the outlet (12, 15), in such a manner that the piston (13, 16) is under a reduced prestress in the abovementioned filling position in the vicinity of the outlet (12, 15).